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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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| 09/466,961 | 12/20/99 | CHANG | Y 8733.20050 |

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| <input type="checkbox"/> | MMC1/0531 | <input type="checkbox"/> EXAMINER |
|--------------------------|-----------|-----------------------------------|

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| <input type="checkbox"/> | BROCK II.P |
| ART UNIT | PAPER NUMBER |

2815

DATE MAILED:

05/31/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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|------------------------------|--------------------------------------|-------------------------------------|
| Office Action Summary | Application No. 09/486,961 | Applicant(s) CHANG ET AL. |
| | Examiner Paul E Brock II | Art Unit 2815 |
| | | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-14 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 December 1999 is/are objected to by the Examiner.
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 - 1) Certified copies of the priority documents have been received.
 - 2) Certified copies of the priority documents have been received in Application No. _____.
 - 3) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- | | |
|---|--|
| 15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) _____ |
| 16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 20) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figures 1 – 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
2. The drawings are objected to because:
 - a. In figure 2 the switch active layer is labeled (29) and should be labeled 21 as shown in figure 1 and described in the specification on page 4, lines 6 – 12.
 - b. In the specification on page 7, line 8 the substrate is referred to as element 121.

Correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear what “a hole barrier layer between the semiconductor layer and at least one of the first and second electrodes.” in claim 13, or “a hole barrier layer between the semiconductor layer and at least one of the source and drain electrodes.” in claim 14 is. The claim language does not set forth a standard for which one of ordinary skill in the art could make and use the claimed invention as it relates to “a hole barrier layer”.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 -~~14~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over the
applicant's admitted prior art in view of den Boer et al. (USPAT 5656824, den Boer).

The applicant's admitted prior art discloses in figure 1 an optical detecting sensor.

With regard to claim 1, the applicant's admitted prior art discloses in figure 1 a sensor thin film transistor (TFT) (C) generating optical current by incident light reflected from an object. The applicant's admitted prior art discloses in figure 1 a storage capacitor storing charges of the optical current generated in the sensor thin film transistor. The applicant's admitted prior art discloses in figure 1 a switching TFT (A) controlling a release of the stored charges of the storage capacitor to an external circuit for display of an image of the object, the switching TFT having source and drain electrodes of a conducting material, an active layer and a gate electrode. The applicant's admitted prior art discloses in figure 1 does not disclose that the switching TFT has dual layered source and drain electrodes of a transparent conducting material and a metal material. den Boer teaches in figure 2 a source electrode (22) having a dual-layered structure of a transparent conducting material (42) and a metal material (40). It would have been obvious to one of ordinary skill in the art at the time of the present invention to use a dual-layered structured source electrode of den Boer in the switching TFT of the applicant's admitted prior art in order to permit the TFT to selectively energize a corresponding pixel in a liquid crystal display as

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stated by den Boer in column 5, lines 21 – 28. The applicant's admitted prior art discloses in figure 1 that a source and drain electrode can be the same. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use a drain electrode that is exactly the same as the dual layered source electrode of den Boer in the switching TFT of the applicant's admitted prior art and den Boer in order to simplify processing steps as is well known in the art.

With regard to claim 2, den Boer discloses in column 5, line 50 that the metal for the dual layered source and drain electrodes of the applicant's admitted prior art and den Boer is a substantially non-transparent metal material.

With regard to claim 3, den Boer discloses in column 5, line 50 that the metal for the dual layered source and drain electrodes of the applicant's admitted prior art and den Boer is chrome.

With regard to claim 4, den Boer discloses in column 5, lines 61 – 63 that the transparent conducting material is indium tin oxide.

With regard to claim 5, den Boer discloses in figure 2 that the dual layered source and drain electrodes of the applicant's admitted prior art and den Boer each comprise a transparent conducting material layer residing on a metal material layer.

With regard to claim 6, den Boer discloses in column 5, line 50 that the metal for the dual layered source and drain electrodes of the applicant's admitted prior art and den Boer is a substantially non-transparent metal material.

With regard to claim 7, the applicant's admitted prior art discloses in figure 1 the switching TFT further comprises an ohmic contact layer (25) on the active layer through which the drain and source electrodes contact the active area. den Boer teaches in figure 2 a contact layer (34) on an active layer (32) through which the dual layered drain and source electrodes of

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contact the active layer. It further would have been obvious that the dual layered contacts of the applicant's admitted prior art and den Boer would contact the active area through the ohmic contact layer.

With regard to claim 8, den Boer teaches in figure 2 that the dual layered source and drain electrodes of the applicant's admitted prior art and den Boer each comprise a transparent conducting material layer residing on a metal material layer.

With regard to claim 9, den Boer teaches in column 5, line 50 that the metal for the dual layered source and drain electrodes of the applicant's admitted prior art and den Boer is a substantially non-transparent metal material.

With regard to claim 10, den Boer teaches in figure 2 that the transparent conducting material layer and the metal material layer each contact the contact layer. Its obvious in the present combination of the applicant's admitted prior art and den Boer that the contact layer is an ohmic contact layer.

With regard to claim 11, den Boer teaches in figure 2 the transparent conducting material layer also contacts the active layer.

With regard to claim 12, den Boer teaches in figure 2 the transparent conducting material layer contacts the active layer at an edge thereof.

With regard to claim 13, the applicant's admitted prior art discloses in figure 1 a sensor TFT having a gate electrode and spaced apart first and second electrodes. The applicant's admitted prior art discloses in figure 1 a switching TFT comprising: a gate electrode, an insulating layer formed on the gate electrode, a semiconductor layer formed on the insulating layer above the gate electrode, and spaced apart first and second electrodes formed on the

semiconductor layer and defining a channel region therebetween in the semiconductor layer. As best the examiner can ascertain, the combination of the applicant's admitted prior art and den Boer similar to claims 1 - 12 reads on a hole barrier layer between the semiconductor layer and at least one of the first and second electrodes. The applicant's admitted prior art discloses in figure 1 a storage capacitor (B) having a first electrode (13) and a second electrode (29), the second electrode of the storage capacitor being connected to the first electrode of the sensor TFT and the second electrode of the switching TFT.

With regard to claim 14, the applicant's admitted prior art discloses in figure 1 a gate electrode formed on the substrate. The applicant's admitted prior art discloses in figure 1 an insulating layer formed on the gate electrode. The applicant's admitted prior art discloses in figure 1 a semiconductor layer formed on the insulating layer above the gate electrode. The applicant's admitted prior art discloses in figure 1 source and drain electrodes spaced apart and formed on the semiconductor layer and defining a channel region therebetween in the semiconductor layer. As best the examiner can ascertain, the combination of the applicant's admitted prior art and den Boer similar to claims 1 - 12 reads on a hole barrier layer between the semiconductor layer and at least one of the source and drain electrodes.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shimada et al., Kanemori et al., Katayama et al., Sakai et al. and Sah all disclose layered source and drain electrodes.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E Brock II whose telephone number is (703)308-6236. The examiner can normally be reached on 8:30 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703)308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.


Paul E Brock II
May 25, 2001


EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800